



Subject card

Subject name and code	, PG_00059190						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026		
Education level	first-cycle studies		Subject group		Obligatory subject group in the field of study		
Mode of study	Part-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Faculty of Civil and Environmental Engineering -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Arkadiusz Ostojski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	25.0	0.0	0.0	0.0	0.0	25
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	25		0.0		50.0	75
Subject objectives	The aim of the course is to provide knowledge about the current requirements for thermal protection of buildings, heating systems, and hot water preparation.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W08] has elementary knowledge of construction: including building materials, their strength, construction mechanics and building physics, moisture migration in buildings, heat transfer through building partitions		The student must demonstrate basic knowledge of building physics. He knows the mechanism of heat transfer through building partitions and the current legal requirements for thermal protection of buildings.		[SW1] Assessment of factual knowledge		
	[K6_W09] has ordered, theoretically founded knowledge in the field of water supply, sewage, heating, ventilation and air conditioning, and the principles of shaping the microclimate of rooms; knows legal regulations, standardization issues and recommendations for the design of water supply, sewage, heating and gas networks and installations		Distinguishes between the types of heating systems and domestic hot water preparation. He knows the current legal requirements for thermal protection of buildings and heating installations.		[SW1] Assessment of factual knowledge		
Subject contents	Lecture: Basics of heat transfer (conduction, convection, radiation). Thermal conductivity of building materials. Calculation values of thermal conductivity. Heat transfer resistances. Thermal resistance of homogeneous and heterogeneous partitions. Air layer resistance. Thermal resistance of ventilated and unventilated air layers. Heat transfer coefficient. Calculation of the heat transfer coefficient of building partitions. Temperature distribution in the partition. Thermal bridges in the partitions. Heat losses to the ground. Air temperature design values. Heat losses through building partitions. Air infiltration. Heat losses on heating the ventilation air. Total design heat loss of the rooms and the design load on the entire building. Energy certificates for buildings. Types of low-temperature heating systems (gravity - pump, with a lower - upper separation, one - two - pipe, floor). Applied protection of open and closed heating installations. Regulation of heating systems. Ways of preparing domestic hot water.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Written exam		60.0%		100.0%		

Recommended reading	Basic literature	1) Koczyk H. (red.): Ogrzewnictwo. Podstawy projektowania ciepłego i termomodernizacji budynków. Poznań: Wydawnictwo Politechniki Poznańskiej 2000 2) Krygier K., Klinke T., Sewerynik J.: Ogrzewnictwo, wentylacja i klimatyzacja. Warszawa: Wydawnictwa Szkolne i Pedagogiczne 1997. 3) Pieńkowski K., Krawczyk D., Tumeł W.: Ogrzewnictwo. T. 1. Białystok: Rozprawy Naukowe nr 63, 1999.
	Supplementary literature	1) Koczyk H. (red.): Ogrzewnictwo praktyczne. Projektowanie, montaż, eksploatacja. Poznań: Systherm Serwis 2005.
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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